

PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: ALFRED PARSONS

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COMPLETE SPECIFICATION

Improvements in or relating to Liquid Dispensing Valves

We, CHADBURNS (LIVERPOOL) LIMITED, a British Company of Park Lane Works, Netherton, Bootle 10, Lancashire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is for improvements in or relating to fluid and more particularly liquid dispensing valves.

It is now becoming the practice in licensed premises to dispense beer and particularly keg beer (e.g. beer which has been chilled, filtered and carbonated) from containers which are pressurised so that the beer is caused to flow to a dispensing valve or tap in the severy or bar. This replaces the older and more laborious procedure of the beer pump.

Beer and like dispensing taps as at present available are, however, open to the objection that they cause or allow excessive foaming or frothing when the beer is dispensed into a glass, this being due to the general agitation of the beer within the tap which causes a rapid release of the CO₂ content to atmosphere and the fobbing agent in the beer. The introduction of an excessive amount of foam or froth into the glass makes it very difficult to fill it, at least with any speed, to the proper level with the required beverage.

One particular application of the present invention is, therefore, to a beer dispensing valve, an object of the invention being to provide such a valve which overcomes the existing difficulty of pouring or dispensing keg or pressurised beer, and in particular such beer having a high CO₂ content.

According to the present invention there is provided the combination with a valve for dispensing liquid (e.g. beer) from a pres-

surised container of a body part having a tapered or like bore or cavity and a plug, core or the like of tapered form located within said bore and spaced slightly from the wall thereof so as to define a restricted space for the flow of liquid from the smaller to the larger end of the tapered bore and thence to the valve, the tapered plug or core having a screw-threaded stem part or extension on which there is screw-threaded a hand-wheel, said hand-wheel being rotatably mounted on the valve body but held against axial movement thereon, so that rotation of the hand-wheel will adjust the tapered plug or core axially whereby adjustment of the restricted space may be effected.

In a preferred embodiment of the invention the plug or core is of tapered or like form and is located in a tapered or like socket or bore in the valve body so that there is an annular restricted space through which the liquid is constrained to flow before reaching the valve. This annular restricted space increases, of course, in effective diameter and cross-sectional area progressively towards the valve. As a result a pressurised liquid such as keg or processed beer is allowed to expand in its passage from the inlet to the outlet of the dispensing means and whilst it may have a relatively high pressure at the inlet its pressure at the outlet is reduced to, or near to atmospheric. In other words, the dispensing means also acts as a pressure reducing device and avoids the introduction of an excessive amount of foam or froth into a glass.

Preferably in the vicinity of the valve the construction is such that the liquid flow is constrained to change or reverse direction. For this purpose the bore or cavity in the valve body may, at its larger end, be turned, curved or radiussed inwardly and against the

direction of flow for the fluid so as partly to form a valve seat for the valve proper.

The degree of adjustment of the tapered plug will depend on the pressure at which the liquid is to be dispensed (e.g. 10 to 12 lbs per square inch in the case of beer) and the position of the source of liquid relatively to the dispensing position. In the case of pressurised beers, given the pressure and the temperature at which the beer or other beverage is likely to be served, it is a relatively simple matter to ascertain or calculate the maximum pressure that can be applied to the beer without further gas being absorbed. This calculated pressure is then applied to the beer container and the dispensing means is adjusted until the flow of the beer into the glass and the thickness of the head is satisfactory.

The invention will be further described, by way of example, as applied to means for dispensing beer or the like. In the following description reference is made to the accompanying drawings wherein:—

The drawing accompanying the provisional specification referred to herein as Figure 1, is a sectional elevation of one form of beer dispensing means according to the invention,

Figures 2 and 3 are sectional side elevations, partly broken away, and show a slightly modified form of the dispensing means shown in Figure 1 and the manner in which it is mounted on, for example, a bar counter, and

Figure 4 is a front elevation of the dispensing means and its mounting arrangement shown in Figures 2 and 3.

The dispensing means shown in Figure 1 of the drawings comprises a body 10 having a tapered bore or socket 11 which receives a tapered plug 12 at the rear of which the valve 13 is located.

The body is provided with an inlet port 14 in which is secured a union 15 by which a hose from the pressurised beer source can be connected to the dispensing means.

Secured to one end of the body 10 by a screwthreaded ring 16 is a member 17 formed with a valve seating 18.

The ring 16 also serves to secure to the body 10 a tubular extension piece 19 provided with an air vent 20 adapted to be opened and closed as hereinafter described by means of a slide valve 21 slidably positioned within the extension 19. Movement of the slide valve 21 is effected by means of a hand lever 22 having a cam part 23 which acts on the rear of the slide valve. The handle 22 also controls the valve 13 and thereby the dispensing of the beer which is discharged via a discharge pipe or spout 24 carried by the extension 19.

The valve 13 comprises a movable valve member 25 having a rubber or like non-contaminating facing 26 adapted to seat on

the seating 18. The valve member 25 has a tubular stem part 27 which slidably houses an enlarged part or plunger 28 on the valve operating spindle or shaft 29, one end of which engages in the rear of the slide valve 21 as indicated at 30. A spring 31 is located between the valve shaft enlargement 28 and the base of the tubular stem 27. A further and stronger spring 32 is located between the stem 27 and the base of a boring 33 in the tapered plug 12, which boring houses and slidably supports the stem 27.

The plug 12 has an annular constriction 34 in register with the port 14 beyond which it has a stem part 35 formed with a screw-threaded extension 36. The screw-threaded extension 36 is screwed into a hand-wheel or nut 37 rotatably supported on the end of the body 10 but held against axial movement thereon. By turning the hand-wheel 37 the tapered plug 12 can be adjusted axially to increase or decrease the tapered annular passage between the plug 12 and the bore 11, available for the flow of liquid from the port 14 to the valve 13. The stem 35 passes through a gland 38 to ensure a fluid-tight joint.

A series of radial pins 39, in the body 10 bear lightly on the cylindrical end of the plug 12 to keep it central and maintain the accurate predetermined dimension of the annular space between the plug 12 and the bore 11.

The dispensing means above described is operated to dispense beer by moving the manual-operating handle 22 to the right as viewed in the drawings. Movement of this handle first causes closing of the air vent 20 by the slide valve 21, the spring 31 permitting this initial movement without movement of the valve 25, 26. After the air vent 20 has been closed further movement of the handle 22 to the right forces the valve 25, 26 off its seat 18 and beer is then allowed to flow from the pipe 15 via the port 14, the space between the plug 12 and the bore 11 and the open valve 13 to the nozzle 24 from which it is dispensed into a glass or the like.

The divergent passageway provided between the plug 12 and the bore 11 reduces the pressure of the beer slowly and smoothly from a relatively high delivery pressure at the inlet 14 to a pressure at or near atmospheric in the region of the valve 13. This enables a glass to be filled speedily to any desired depth and the beer to be given a closely knit head without objectionable frothing. It will be noted that the valve seat 18 is especially formed at 18a to reverse the direction of flow of the beer. This allows the beer to follow the contour of the valve seat without agitation or the formation of reverse eddy currents and pockets of trapped gas or air. This still further promotes dis-

pensing of the beer into a glass without objectionable foaming or frothing.

On the return movement of the operating handle 22 to the left the valve 13 closes first, after which the vent 20 is opened thereby venting the valve chamber 39 and the dispensing tube 24 to atmosphere. This minimises objectionable after-drip from the dispensing tube.

The hand-wheel or nut 37 enables the plug 12 to be adjusted axially to pre-set the size of the annular space between it and the bore 11 to suit the type of beer, CO₂ content and the flow rate or a combination of all three. Optimum results can be obtained by this adjustment to suit individual conditions. It will be appreciated that the hand-wheel or nut 37 can be adjusted by hand or by a suitable tool from the outside of the dispensing means, no dismantling being necessary to effect the required adjustment of the plug 12 to suit particular conditions.

The embodiment of the invention shown in Figures 2, 3 and 4 is similar, so far as the dispensing means itself is concerned, to that already described with reference to Figure 1 and where applicable like reference numerals have been used to designate like parts. One particular difference is that the shaft 29 is formed integrally with the stem 27 and a spring 40 replaces the spring 31.

The dispensing means is shown in Figures 2, 3 and 4 as being mounted on a hollow stand or pedestal 41 which houses the beer supply pipe 42 and is secured to the bar counter B.

It will be appreciated that the bore 11 may be defined by a lining in the body 10.

The dispensing means above described has been particularly designed to meet the requirements of the brewing industry for a tap which will dispense processed beer or draught beer without agitation and excessive foam or froth into a pint or half-pint or other glass or the like and furthermore without after-drip and consequent wastage.

Other advantageous features of the dispensing means above described are that it can readily be mounted so that it can be inclined to set the pouring spout 24 vertical or approximately so and it is readily connected by means of the connector 15 and a flexible beer hose to the beer keg, barrel or other source of supply. The dispensing means may, of course, be designed so that it can be driven or otherwise secured directly into a beer or like keg or barrel.

WHAT WE CLAIM IS:—

1. The combination with a valve for dispensing liquid (e.g. beer) from a pressurised container of a body part having a tapered or like bore or cavity and a plug, core or the like of tapered form located within said bore and spaced slightly from the wall thereof so as to define a restricted space for

the flow of liquid from the smaller to the larger end of the tapered bore and thence to the valve, the tapered plug or core having a screw-threaded stem part or extension on which there is screw-threaded a hand-wheel, said hand-wheel being rotatably mounted on the valve body but held against axial movement thereon, so that rotation of the hand-wheel will adjust the tapered plug or core axially whereby adjustment of the restricted space may be effected.

2. The combination claimed in claim 1 wherein means (e.g. a series of pins which bear on the plug at its end remote from the stem part) is provided which engage the tapered core or plug to keep it central within the tapered bore and maintain the accurate predetermined dimension of the annular space between the tapered plug and the tapered bore.

3. The combination claimed in either of the preceding claims wherein, in the vicinity of the valve the construction is such that the fluid flow is constrained to change or reverse direction.

4. The combination claimed in claim 3 wherein at its larger end the bore, cavity or socket in the valve body is turned, curved or radiussed inwardly and against the direction of flow for the fluid so as partly to form a valve seat for the valve proper.

5. The combination claimed in any of the preceding claims and wherein the operating means for the valve is also adapted to operate a venting valve.

6. The combination claimed in any of the preceding claims wherein the valve has a stem or the like which is slidably positioned in a socket in the plug or core and is spring-loaded towards a valve seat by a spring located in said socket.

7. The combination claimed in claim 6 wherein the stem of the valve proper slidably receives a plunger or the like of a valve-operating member, a compression spring being located in the valve stem and acting on said plunger.

8. The combination claimed in any of the preceding claims 5 to 7 wherein the venting valve is a slide valve adapted to be moved by a valve-operating handle or the like with respect to a venting port.

9. The combination claimed in any of the preceding claims 5 to 8 wherein the venting arrangement is such that the venting valve closes before the fluid flow control valve proper opens and opens after said valve proper has closed.

10. A fluid flow control means substantially as herein described with reference to Figure 1 or Figure 2 of the accompanying drawings.

11. A beer or like beverage dispensing means as claimed in any of the preceding claims and mounted or adapted to be

mounted on a bar or like counter substantially
as herein described with reference to Figures
2 and 3 of the accompanying drawings.

E. R. ROYSTON & CO.,
Agents for the Applicants,
Chartered Patent Agents,
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